

Psychosocial job adversity and health in Australia: analysis of data from the HILDA Survey

Abstract

Objective: This study examines measures of psychosocial job quality developed from the Household Income and Labour Dynamics in Australia (HILDA) Survey, and reports on associations with physical and mental health.

Methods: The study used seven waves of data from the HILDA Survey with 5,548 employed respondents. Longitudinal random-intercept regression models assessed the association of time-varying and between-person measures of psychosocial job quality job adversity with physical and mental health.

Results: Respondents' specific experience of psychosocial job adversity, except marketability, was associated with increased risk of mental health problems, whereas the association between psychosocial job adversity and physical health was largely driven by differences between people.

Conclusions and Implications: Moving into jobs with different psychosocial quality is associated with changes in mental health. In contrast, individuals with poor physical health show an increased propensity to work in poor-quality jobs but it seems that changes in physical health are not as strongly tied to changes in job quality. Differences in the relationship between physical and mental health and psychosocial job quality have implications for the design of employment, health and social policy. The HILDA Survey is an important resource for policy development in Australia, and the availability of valid measures of psychosocial of job quality will enhance its use to better understand this important determinant and correlate of health.

Key words: psychosocial job quality, physical health, mental health, epidemiology

Aust NZ J Public Health. 2011; 35:564-71
doi: 10.1111/j.1753-6405.2011.00771.x

Peter Butterworth , Liana S. Leach

Centre for Mental Health Research, The Australian National University, Australian Capital Territory

Bryan Rodgers

The Australian Demographic & Social Research Institute, The Australian National University, Australian Capital Territory

Dorothy H. Broom

National Centre for Epidemiology and Population Health, The Australian National University, Australian Capital Territory

Sarah C. Olesen

Centre for Mental Health Research, The Australian National University, Australian Capital Territory

Lyndall Strazdins

National Centre for Epidemiology and Population Health, The Australian National University, Australian Capital Territory

Work has a salient role in the life of most Australian adults. It provides a source of income to maintain material standards of living.¹ Work also plays a critical social and psychological role: facilitating people's social connections, their participation in a community, and providing a sense of purpose and identity.²⁻⁴ Participation in work is associated with better health⁵ and, while there is undoubtedly a bi-directional relationship between work and health,⁶ it is clear that being employed bestows health benefits.^{7,8}

It is not only the absence of a job that is associated with poor physical and mental health, but also the characteristics and quality of the job.⁹ While exposure to physical hazards in the workplace, or the (in)adequacy of pay, employment tenure or hours worked are factors that link work to poor health, so too are the psychosocial characteristics of jobs.¹⁰ The psychosocial characteristics of work such as job demands, decision latitude/control, job

strain, and perceptions of job insecurity, are independent of status and income and may occur among those with high status jobs.¹¹ Given the ubiquitous nature of these health risk factors and the resultant social and personal consequences, policy development in the domains of public health, social welfare, employment and workplace relations would be enhanced by efforts to better understand the impact of adverse psychosocial job characteristics on health. Such a focus is consistent with the research evidence on the psychosocial and environmental determinants of health.¹² The role of the psychosocial work environment and the impact of broader employment and labour market policies on health is reflected in their identification in both the final report of the WHO Commission on the Social Determinants of Health¹³ and the more recent Marmot review to identify effective evidence-based strategies for reducing health inequalities in England.¹⁴ Such a focus in policy and intervention is

Submitted: August 2010

Revision requested: March 2011

Accepted: June 2011

Correspondence to: P. Butterworth, Centre for Mental Health Research, Bldg 63, Eggleston Rd, The Australian National University, Canberra, ACT; e-mail: Peter.Butterworth@anu.edu.au

consistent with the population approach to mental health outlined in the third and fourth National Mental Health Plans^{15,16} and may also be an important aspect of socially inclusive policies seeking to promote participation and engagement and address disadvantage.¹⁷⁻¹⁹

In Australia, the Household, Income and Labour Dynamics in Australia (HILDA) Survey would be an ideal dataset with which to explore the consequences of job quality, given the national sampling frame, the availability of several waves of data, the extensive data on employment and labour-force characteristics and transitions, the inclusion of adequate measures of health, and the fact that it is a publicly available dataset. However, at wave 1 the HILDA Survey did not include the scales of psychosocial job quality that are widely used within the international epidemiological literature such as those based on the Effort-Reward Imbalance (ERI) Model²⁰ or the Demand-Control-Support Model.²¹ In previous published research, we have reported on the development and validation of measures of psychosocial job quality based on the items and scales that were available in all waves of the HILDA Survey. The researchers who developed the HILDA Survey report that they drew these items from a range of previous economic and social surveys.²²

Twelve job quality items included in the self-completion questionnaire (SCQ) of each wave of the HILDA Survey can be combined to form valid measures of three aspects of psychosocial job quality.²³ Factor analytic techniques showed that the three factor theory of job quality proposed by Strazdins et al.¹¹ provided an adequate solution to summarise the contribution of (most of) the 12 items cross-sectionally and across time. The three factors were labelled: i) job demands and complexity, ii) job control, and iii) job security. The current analysis considers other items from the HILDA Survey that represent other important aspects of psychosocial job quality. After Broom and colleagues,¹⁰ we consider jobs identified with low marketability and a somewhat-related measure of satisfaction with employment opportunities. The current analysis also draws on aspects of the effort-reward imbalance model.^{24,25} While the full implementation of this model posits that strain results from a perceived mismatch between employees' efforts at work and a range of possible rewards including income, esteem, or career opportunities and security,²⁴ the focus of the current analysis is on respondents' perception of not being fairly paid for their efforts at work. We also consider job strain, which is defined as the combination of high job demands and low decision latitude or control.²¹

The aim of the current analysis is to examine the association of the various measures of psychosocial job adversity with physical and mental health using seven waves of data, and to consider whether the relationship reflects differences between people or correlated change in health and employment circumstances over time.

Method

Data

This study reports analysis of data from the first seven waves of the HILDA Survey (release 7.0). This is a nationally representative household panel survey conducted annually since 2001. The

survey was conducted in accordance with the University of Melbourne's Ethics Guidelines. The survey used a multi-stage sampling approach, sampling households within dwellings within a selection of administrative areas. At baseline, there were 7,682 responding households (response rate of 66%). Within households, 13,969 household members aged 15 years and over completed a personal interview and 94% of these returned a self-completion questionnaire (SCQ). Attrition in the HILDA Survey is similar to other international household panels such as the BHPS.²⁶

This analysis is restricted to respondents who participated in the wave 1 interview and returned the SCQ, and who subsequently provided interview and SCQ data on at least two further occasions. As the focus of this analysis is on psychosocial job quality, it is restricted to those respondents who are in the workforce. Further, to avoid the potentially confounding influence of normative transitions into and out of the workforce the analysis was restricted to those respondents aged between 20 and 55 at wave 1. Thus, the analysis is based on 5,548 wave 1 respondents and 31,797 observations (an average of 6.2 observations per respondent).

The development and description of measures of psychosocial job quality

HILDA Survey respondents who were employed completed a module of 12 items which assessed various characteristics of work. Previous factor analysis and structural equation modelling of these items identified three theoretically meaningful factors.²³ These factors reflect job demands and complexity (primarily focused on job complexity; four items such as *'My job is complex and difficult'*, $\alpha = 0.70$, higher scores reflect greater demands), job control (three items such as *'I have freedom to decide how I do my work'*, $\alpha = 0.82$, higher scores reflect greater control), and perceived job security (three items such as *'I have a secure future in my job'*, $\alpha = 0.64$; higher scores reflect greater security; one item [*'worry about future of job'*] was reverse coded). The results of factor analysis showed that the item loadings were invariant across the seven waves, and that the factors demonstrated predictable associations with more widely used measures of job demands and control.²⁷ Because the focus of the current analysis is on evaluating the health consequences of adverse psychosocial job conditions, we have omitted the item *'I fear that the amount of stress in my job will make me physically ill'* from the scales due to concern about potential circularity. This analysis constructed these scales by summing across the relevant items. For those respondents with missing data for some items, scale scores were based on completed items and weighted up to the expected total had all items been answered.

Apart from the factors discussed above, the current analysis also considered a number of items included in all seven waves of the HILDA Survey that assess different psychosocial job characteristics. After Broom et al.,¹⁰ we considered *'job marketability'* (a person's perceived ability to get another similar job). An item included in the main HILDA Survey interview asked all employees to estimate the chance (%) that, if they were to lose their job, they would find and accept a job at least as good. Survey respondents who were

self-employed or employers were not asked this question. A second measure related to the marketability concept was based on another item that asked respondents to report their satisfaction with their employment opportunities. This was assessed using an 11-point scale, with descriptive anchors at 0 (totally dissatisfied), 10 (totally satisfied) and at the mid-point (5: neither satisfied nor dissatisfied). Another satisfaction item assessed respondents' satisfaction with their job security and this item was used as an alternative measure of job security for those respondents with missing data for all of the job security items.

One item from the SCQ job conditions module assessed whether respondents considered they were paid fairly for their work (*'I get paid fairly for the things I do in my job'*). This item did not fit within the scales representing job demands and complexity, job control or perceived job security. For the current analysis, this item was considered a measure of effort-reward unfairness.²⁰ This item was assessed using a 7-point scale ranging from 0 'strongly disagree' to 6 'strongly agree'.

For each aspect of psychosocial job quality measured, respondents with scores in the quartile of the distribution corresponding to greatest adversity (e.g. high job demands/complexity, low job control, high insecurity, low marketability, limited employment opportunities and high effort-reward unfairness) were categorised as experiencing that psychosocial job adversity (for example, see ^{10,27}). A measure of job strain was also constructed from the combination of high job demands/complexity and low job control. Table 1 presents details of the scales, cut-points, and the percentage of respondents identified with each job adversity, as well as information on levels of missing data.

Other measures

Mental health was assessed using the five-item Mental Health Inventory (MHI), a subscale from the SF-36 general health

survey. The MHI assesses symptoms of depression and anxiety (nervousness, depressed affect) and positive aspects of mental health (feeling calm, happy) in the past four weeks. The MHI has reasonable validity and is an effective screening instrument.^{28,29} The current analyses use a dichotomous measure, with those with mental health scale scores less than 50 categorised as having mental health problems.³⁰ Similarly, a dichotomous measure of physical impairment was derived from the Physical Functioning subscale of the SF-36, with scores below 68 (1 standard deviation below the mean) identified with poor physical health.

Covariates included measures of age, sex, relationship status (married or de facto), having dependent children, and highest level of educational attainment. A number of direct measures of employment conditions were also examined. These measures were collected at each wave and included whether respondents were employed casually, whether they had a supervisory role, whether they worked regular daytime shifts, the number of hours they usually worked per week, their usual pay, and a classification of their occupational skill level based on ANZSCO coding.³¹ For the current analyses, measures which used continuous scales (hours worked, salary) and the occupational skill level were categorised into tertiles (high, medium or low). An additional category was included for salary representing respondents who reported working for no income. An item which asked whether respondents had changed jobs in the past year was used to differentiate between those who changed their assessment of the psychosocial characteristics of their job and those who moved between jobs with different characteristics.

Statistical approach

The initial descriptive statistics present the percentage of respondents who experienced each adversity at baseline (wave 1), the percentage of all observations in which each adversity was identified, and a between-person effect which reflects the percentage

Table 1: Description of psychosocial job quality measures.

Item/scale	Missing data	Continuous scale characteristics				% with adversity		
		Mean	Range	SD	Cut-point	Wave 1 (%)	Overall (%)	Any (%)
Job demands & complexity	3.1%	13.5	0 to 24	4.8	>20	32.8	27.9	55.6
Job control	3.2%	10.2	0 to 18	4.7	<10	24.6	23.3	50.8
Job strain						6.3	5.5	17.1
Job security								
a) Scale	3.1%	13.0	0 to 18	3.8	<11	30.3	24.3	57.6
b) Satisfaction with job security (only those missing scale data)	2.0%	7.3	0 to 10	2.8	<7	29.1	28.9	34.0
Overall job security	0.1%					30.3	24.5	58.6
Marketability: Employees probability of similar job	19.8%	63.9	0 to 100	33.7	<50	24.4	23.7	51.0
Dissatisfaction with employment opportunities	1.7%	7.5	0 to 10	2.0	<5	29.9	24.8	57.1
Effort-reward unfairness	3.3%	3.6	0 to 6	1.7	<4	27.7	26.0	62.2

of respondents who at some point during their participation in the HILDA Survey were identified as experiencing each adversity.

A series of random-intercept logistic regression models with robust standard errors to account for respondent clustering within households was used to regress the binary health measures (mental and physical health) on each measure of psychosocial job adversity. After an initial univariate model (Model A), the subsequent Model B evaluated the robustness of the findings by including the socio-demographic covariates and direct measures of employment circumstances. The third set of models (Model C) included both a time-varying and time-invariant measure of each job adversity, along with the socio-demographic covariates. The goal of this analysis was to determine whether the association between health and psychosocial job adversity reflected that these factors covaried over time (i.e. changing job conditions associated with changing health) or whether it was more that individuals who experienced adverse job conditions at some point had poorer health overall. The

final model (D) repeated model C but examined lagged predictors and was restricted to those respondents who reported that they did not change jobs or job circumstances during the intervening period. Previous health status was also included as a covariate in this model. This final model enabled assessment of the prospective effect of psychosocial job characteristics on health. Sensitivity analyses utilised the continuous scales of psychosocial job characteristics and utilised a more stringent cut-point to define the binary measures (e.g. 10% rather than 25%).

Across the seven waves of data, attrition was 21.1% for completion of interview and SCQ. For each of the key socio-demographic and psychosocial job quality measures in each wave, the average level of missingness was 1.3%, ranging from 0 to 4.5%. Missingness was higher for measures based on items from the SCQ. Cases with missing data were excluded on an analysis-by-analysis basis. An advantage of the random-effect regression models used in this analysis is that data from all available waves can be used in the

Table 2: Odds ratios (and standard errors) of measures of adverse psychosocial job quality predicting mental health, contrasting results from univariate and multivariate longitudinal logistic regression models.

	Model A ^a	Model B ^b	Model C ^c	Model D ^d Lagged effect
Mental Health				
High job demands & complexity ^e	1.45 (1.26 – 1.67)	1.67 (1.42 – 1.96)	1.45 (1.25 – 1.70)	1.58 (1.25 – 2.00)
+ Between person effect ^f			1.21 (0.98 – 1.49)	1.08 (0.87 – 1.33)
Low job control	1.82 (1.58 – 2.09)	1.69 (1.45 – 1.96)	1.59 (1.36 – 1.85)	1.27 (1.01 – 1.60)
+ Between person effect			1.36 (1.10 – 1.67)	1.27 (1.04 – 1.56)
Job strain	2.27 (1.82 – 2.83)	2.35 (1.87 – 2.95)	1.88 (1.48 – 2.37)	1.41 (0.91 – 2.18)
+ Between person effect			1.64 (1.28 – 2.09)	1.42 (1.12 – 1.80)
Low job security	2.19 (1.93 – 2.49)	2.08 (1.80 – 2.40)	1.77 (1.55 – 2.02)	1.76 (1.43 – 2.17)
+ Between person effect			2.50 (2.03 – 3.09)	1.82 (1.49 – 2.22)
Low marketability	1.11 (0.95 – 1.30)	1.18 (1.00 – 1.38)	1.07 (0.90 – 1.27)	0.97 (0.75 – 1.25)
+ Between person effect			1.38 (1.11 – 1.72)	1.28 (1.04 – 1.57)
Dissatisfaction with employment opportunities	2.36 (2.07 – 2.69)	2.18 (1.89 – 2.52)	1.81 (1.58 – 2.07)	1.81 (1.46 – 2.24)
+ Between person effect			2.90 (2.34 – 3.59)	1.66 (1.35 – 2.04)
Effort-reward unfairness (pay)	1.69 (1.48 – 1.92)	1.56 (1.35 – 1.80)	1.49 (1.30 – 1.71)	1.68 (1.34 – 2.09)
+ Between person effect			1.68 (1.35 – 2.07)	1.39 (1.12 – 1.71)

a model includes no covariates

b covariates are age, sex, partner status, dependent children, educational attainment, working regular hours, supervisor status, casual work, hours worked (tertiles), pay (tertiles and no pay), job skill level (tertiles and no information)

c covariates are age, sex, partner status, dependent children, educational attainment, and between person effect

d Model tested effect of lagged employment conditions on mental health; covariates are age, sex, partner status, dependent children, educational attainment, lagged mental health problems and the between person effect

e Time-varying predictor

f Any experience of adverse psychosocial job quality during survey

calculation of estimates (despite attrition), and it does not require a fully balanced, complete dataset. All analyses were conducted using Stata 10.0.

Results

Of the 5,548 wave 1 respondents, 48.3% were female, 72.2% were either married or in a de facto relationship and 42.0% had a dependant child(ren). A total of 24.7% of respondents had not completed their high school education while, at the other extreme, 27.2% had a tertiary education qualification. There were 21.6% of respondents aged between 20 and 29 years, 32.2% between 30 and 39 years, 32.2% between 40 and 49 years, and 14.0% between 50 and 55 years. The final three columns of Table 1 present descriptive data on the components of psychosocial job quality at baseline (wave 1) and longitudinally. As outlined in the methods section, the definition of psychosocial job adversity is a relative measure and

the selection of cut points was designed to identify approximately one quarter of the population as experiencing each type of adversity.

The longitudinal descriptive data are presented in two ways. The 'overall' percentage represents estimates of adversity across all occasions, disregarding the fact that the same individuals responded in multiple waves. The 'any' column represents the percentage of respondents who reported each adversity at some point during the study. More than half of all respondents experienced each component of psychosocial job adversity at some point during the survey period (apart from the job strain measure).

Mental health

Table 2 presents the odds ratios (and 95% confidence intervals) from a series of random-intercept longitudinal logistic regression models examining the strength and nature of the association between psychosocial job adversity and the experience of mental health problems. The first and second columns show that, apart from

Table 3: Odds ratios (and standard errors) of measures of adverse psychosocial job quality predicting physical health, contrasting results from univariate and multivariate longitudinal logistic regression models.

	Model A ^a	Model B ^b	Model C ^c	Model D ^d Lagged effect
Physical Health				
High job demands & complexity ^e	0.96 (0.83 – 1.17)	1.00 (0.84 – 1.19)	0.98 (0.83 – 1.15)	1.09 (0.88 – 1.36)
+ Between person effect ^f			1.25 (1.00 – 1.55)	1.16 (0.96 – 1.40)
Low job control	1.11 (0.96 – 1.29)	1.04 (0.89 – 1.22)	1.02 (0.86 – 1.19)	1.23 (0.99 – 1.55)
+ Between person effect			1.30 (1.05 – 1.61)	1.36 (1.12 – 1.64)
Job strain	1.10 (0.85 – 1.42)	1.09 (0.83 – 1.43)	0.99 (0.76 – 1.30)	1.26 (0.80 – 1.99)
+ Between person effect			1.46 (1.12 – 1.91)	1.34 (1.06 – 1.69)
Low job security	1.33 (1.16 – 1.53)	1.24 (1.06 – 1.45)	1.15 (0.99 – 1.32)	1.16 (0.94 – 1.43)
+ Between person effect			1.97 (1.59 – 2.44)	1.48 (1.24 – 1.77)
Low marketability	1.23 (1.05 – 1.44)	1.13 (0.96 – 1.33)	1.05 (0.89 – 1.25)	1.08 (0.84 – 1.38)
+ Between person effect			1.23 (0.98 – 1.55)	1.12 (0.91 – 1.38)
Dissatisfaction with employment opportunities	1.45 (1.26 – 1.66)	1.24 (1.07 – 1.45)	1.18 (1.02 – 1.36)	1.30 (1.06 – 1.60)
+ Between person effect			1.98 (1.60 – 2.46)	1.49 (1.24 – 1.78)
Effort-reward unfairness (pay)	1.16 (1.01 – 1.33)	1.13 (0.97 – 1.32)	1.10 (0.95 – 1.27)	1.29 (1.04 – 1.59)
+ Between person effect			1.36 (1.09 – 1.69)	1.24 (1.03 – 1.49)

^a model includes no covariates

^b covariates are age, sex, partner status, dependent children, educational attainment, working regular hours, supervisor status, casual work, hours worked (tertiles), pay (tertiles and no pay), job skill level (tertiles and no information)

^c covariates are age, sex, partner status, dependent children, educational attainment, and between person effect

^d Model tested effect of lagged employment conditions on physical health; covariates are age, sex, partner status, dependent children, educational attainment, lagged physical health problems and the between person effect

^e Time-varying predictor

^f Any experience of adverse psychosocial job quality during survey

marketability, all other time-varying measures of job adversity were associated with poor mental health and, further, that these relationships were little changed by the inclusion of covariates including employment conditions. The test of marketability was significant (at $p=0.047$) in Model B. Across the set of analyses, being female, younger, not working regular hours and, to a lesser extent, having a casual job, lower income and low-skilled occupation were also independently associated with poorer mental health. The models described in the third column include terms reflecting the time-varying and between-person effects of each psychosocial job adversity. Again, apart from marketability ($p=0.428$), all the time-varying effects remained significant and were not markedly different to the univariate results. There were also significant between-person effects for all measures apart from job demands/complexity (though with $p=0.082$) indicating that respondents who reported these psychosocial job conditions at some point during the survey reported poorer mental health overall, not just in those circumstances when they experienced the adversity. Model D, reporting a lagged analysis (regressing current health on previous employment circumstances) for those respondents who had not changed jobs in the previous 12 months, confirms the results of Model C though job strain is no longer a significant time varying predictor of mental health ($p=0.124$).

Physical health

Table 3 presents the results of a similar set of analyses for the physical health outcome. Job insecurity, low marketability, dissatisfaction with employment opportunities, and effort-reward unfairness ($p=0.038$) were each associated with poor physical health in Model A, though the effects were generally weaker than those evident for the mental health outcome. The inclusion of the comprehensive set of covariates (Model B) weakened all of these effects, with low marketability ($p=0.128$) and effort-reward unfairness ($p=0.105$) no longer significant at the $p < 0.05$ level. Across these models, older age, not working regular hours, working for no or low pay, and working in low-skilled jobs were also associated with poor physical health. The models incorporating both within- and between-person effects (Model C) demonstrated that it was largely the between-person effects that were significantly associated with physical health problems (six of the seven psychosocial job adversities, with marketability $p=0.073$), whereas only the time-varying effects of dissatisfaction with employment opportunities and job insecurity (marginal at $p=0.060$) showed evidence of an association with physical health problems. The final lagged model showed a similar pattern of results: only the time-varying measure of dissatisfaction with employment opportunities and effort-reward unfairness were significantly associated with subsequent physical health problems, with job control of marginal significance (OR=1.23, $p=0.066$).

Sensitivity analyses

The same general pattern of results observed in Model B for mental and physical health problems were obtained when job

adversity was based on a 10% cut-point. For physical health, the effect of insecurity showed a similar Odds Ratio but was of marginal significance (OR=1.22, 0.97 – 1.51; $p = 0.084$) and the effect of low marketability was significant (OR=1.39, 1.13 – 1.71; $p=0.002$). Similarly, the use of the continuous scale scores for job conditions produced similar results to the categorical measures reported for Model B.

Discussion

This study examined psychosocial job quality based on measures available in the publicly available HILDA Survey dataset. The measures captured many of the important constructs in the research literature including: job demands and job complexity; job control; perceived job security; marketability; and aspects of effort-reward imbalance. Our previous analyses have confirmed the validity of these measures²³ and showed that the experience of psychosocial job adversity is associated in a predictable manner with other, related measures of job characteristics.³² For example, high job demands and complexity was associated with working long hours and high occupational skill level. Low job control was associated with working for no pay and being in a low-skilled occupation. Low perceptions of job security were reported by those in casual employment. Low levels of marketability were reported by those working for no pay, dissatisfaction with employment opportunities by those in low-skilled occupations, and perceptions of effort-reward imbalance by those with low pay levels. This previous analysis also includes details of the items included in the measures of psychosocial job adversity.³²

The current results provided evidence of the importance of these constructs for public health in Australia. Across models, respondents who reported each type of psychosocial job adversity (with the exception of low marketability) consistently had an increased risk of mental health problems, and these relationships were not explained by direct job characteristics. There was evidence that those individuals with a propensity to work in poor quality jobs had poorer overall mental health. However, significant time-varying effects were also present indicating that change in mental health was correlated with change in psychosocial job characteristics. The results were different for the physical health outcome, with relatively weak associations evident between the time-varying measures of psychosocial job adversity and poor physical health (though the initial effect of marketability was stronger than for mental health) and much stronger evidence for between-person effects. Thus, those individuals at risk of working in jobs with poor psychosocial conditions were more likely to report poor physical health overall, and change in job quality was generally not associated with change in physical health. This pattern of results is more consistent with there being a selection effect of physical health.

These findings are consistent with a large body of cross-sectional and (to a lesser extent) longitudinal research findings which show a negative association between various aspects of psychosocial work conditions and health.^{9,33} Meta-analysis by Stansfeld and Candy⁹

found that low job control (decision latitude), high job demands and job insecurity had a moderate association with risk of common mental disorders, while effort-reward imbalance (broader than our current definition) and job strain (the combination of high demands and low control) had a strong association with mental disorders. The current results are broadly consistent with these conclusions, though the effect of low job security was very strong in the current analysis (OR = 2.2 in the model with covariates included) and our measure of effort-reward unfairness (focused exclusively on perceived inadequacy of pay) was weaker though still showing an OR of 1.58. We found that marketability did not demonstrate the same pattern of association with mental health as the other measures of psychosocial job quality and differed from the somewhat conceptually similar measure of satisfaction with employment opportunities.¹⁰ The relationship between adverse psychosocial work conditions and poor physical functioning is also evident in the research literature.^{34–36} It is unclear, however, why the current results failed to demonstrate a significant association between demands and complexity and physical health as found in this previous research.

The most important contribution that this study makes is to clarify the nature of the longitudinal relationship between health and psychosocial job quality. We used random-intercept logistic regression models to evaluate the relationship between job quality and health over time and explicitly decomposed each job quality effect into two separate terms representing a stable between-person effect and a time-varying within-person effect.³⁷ We can, therefore, contrast the tendency for those individuals who, at some point, report a poor quality job to have poor health from the change in health associated with specific changes in job quality. The results for the mental health outcome support the presence of both effects. Individuals who at some point worked in jobs characterised by low control, strain, low security, low marketability, dissatisfaction with their employment opportunities and unfair pay were more likely to report mental health problems than those without this susceptibility. However, over and above this effect, individuals' specific experience of psychosocial job adversity was accompanied by poorer mental health. Theoretically, this may reflect psychological pathways, such as feelings of hopelessness and helplessness from an untenable employment situation.³⁸ The lagged analysis indicated that employment circumstances preceded the change in mental health. From a policy perspective it is important to recognise that, just as adverse psychosocial job condition may lead to poor mental health, it is possible that workplace changes which improve the quality of one's job could be an effective strategy to improve population mental health. In contrast to these results, the within-person effects of physical health that were present were much weaker (dissatisfaction with opportunities) or of marginal statistical significance (insecurity and job control). This is, therefore, more consistent with hypotheses of health selection into poor quality employment, poor health as a barrier to improvement in employment circumstances, and entrenched disadvantage.

The availability of valid measures of psychosocial job quality represents an important adjunct to the HILDA Survey dataset. The HILDA Survey is a federally funded, national household panel

survey, with funding assured for continued data collection through 2012. The survey data are made available to the research community and, as of 2009, there were 1,230 registered HILDA Survey users and an extensive output that includes 222 journal articles.²⁶ The HILDA Survey is a critical resource for policy development in Australia. The survey has a strong focus on employment and labour-market issues, and the analysis reported in this manuscript suggests that there are appropriate measures in the survey to enable researchers to evaluate the effects of psychosocial job quality. With valid measures of psychosocial job quality, more objective measures of employment circumstances and income, and detailed data on family circumstances and health, the HILDA Survey is a valuable national and international resource.

There are a number of study limitations that need to be recognised. We were restricted to those scales and items available in the HILDA Survey and, as a result, were not able to assess constructs as comprehensively as we would like (e.g., focus on satisfaction with pay rather than other psychological benefits of work) and were unable to measure other aspects of psychosocial job quality at all (e.g. social support at work). Nonetheless, we have validated the psychosocial measures against benchmarks of employment conditions and demonstrated predictable associations with mental and physical health outcomes. Missing data and attrition is an issue with any longitudinal survey and we maximised the utilisation of data through our selection of longitudinal techniques. Given that both the measures of psychosocial job quality and (physical and mental) health were self-report, it is possible that response endogeneity or response bias may have confounded the results. This is less likely to influence the direct measures of employment circumstances, and thus our previous validation allays some concerns about this effect. However, we do note that this is an issue that needs to be considered in future analyses using these measures. It must also be recognised that the measures of psychosocial job quality are relative measures. That is, they reference poor job quality relative to that reported in the population. However, this is a common approach and used in measures such as poverty.³⁹ Finally, our analysis was restricted to respondents of prime working age, which we defined as 20 to 55 years at baseline. This was to avoid potential influence on the current results of the health correlates of normative transitions into and out of the workforce.⁴⁰ However, given the policy focus on delaying retirement, a focus on the role of psychosocial job adversity in the retirement transitions of older Australian adults represents an important future extension of the current project.

In conclusion, the current results confirmed that psychosocial job adversity is associated with poorer physical and mental health, but showed that mental health is most sensitive and more likely to alter in response to changes in job quality over time. Poor physical health, in contrast, was more strongly associated with the propensity to work in jobs with psychosocial adversity and may, therefore, be a selection factor. Future research that considers the longitudinal association between psychosocial job quality and mental and physical health using HILDA Survey data will help to inform appropriate public policy development.

Acknowledgements

This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and is managed by the Melbourne Institute of Applied Economic and Social Research (MIAESR). The findings and views reported in this paper, however, are those of the author and should not be attributed to either FaHCSIA or the MIAESR.

Financial support for this project was received from the Australian Government Department of Families, Community Services, and Indigenous Affairs through the Social Policy Research Services Contract. Butterworth and Rodgers are funded by NHMRC Fellowships #525410 and #471429.

References

1. Fryer D. Employment deprivation and personal agency during unemployment: A critical discussion of Jahoda's explanation of the psychological effects of unemployment. *Social Behaviour*. 1986;1:3-23.
2. Dooley D, Fielding J, Levi L. Health and unemployment. *Annu Rev Public Health*. 1996;17:449-65.
3. Jahoda M. Work, employment and unemployment: Values, theories and approaches in social research. *Am Psychol*. 1981;36:184-91.
4. Warr P. Factors influencing the psychological impact of prolonged unemployment and of re-employment. *Psychol Med*. 1985;15:795-807.
5. Jin RL, Shah CP, Svoboda TJ. The impact of unemployment on health: a review of the evidence. *CMAJ*. 1995;153:529-40.
6. Bartley M. Unemployment and health: selection or causation – a false antithesis? *Social Health Illn*. 1988;10:41-67.
7. Reine I, Novo M, Hammarstrom A. Does transition from an unstable labour market position to permanent employment protect mental health? Results from a 14-year follow-up of school-leavers. *BMC Public Health*. 2008;8:159.
8. Vuori J, Silvonen J. The benefits of a preventive job search program on re-employment and mental health at 2-year follow-up. *Journal of Occupational and Organizational Psychology*. 2005;78:43-52.
9. Stansfeld S, Candy B. Psychosocial work environment and mental health – a meta-analytic review. *Scand J Work Environ Health*. 2006;32:443-62.
10. Broom DH, D'Souza RM, Strazdins L, Butterworth P, Parslow R, Rodgers B. The lesser evil: bad jobs or unemployment? A survey of mid-aged Australians. *Soc Sci Med*. 2006;63:575-86.
11. Strazdins L, D'Souza RM, Lim LL, Broom DH, Rodgers B. Job strain, job insecurity, and health: rethinking the relationship. *J Occup Health Psychol*. 2004;9:296-305.
12. Marmot M. Social determinants of health inequalities. *Lancet*. 2005;365:1099-104.
13. Commission on Social Determinants of Health. *Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health. Final Report*. Geneva (CHE): World Health Organization; 2008.
14. Marmot M. Fair Society, Healthy Lives, Report of the Strategic Review of Health Inequalities in England post-2010. London (UK): Government of United Kingdom; 2010.
15. Australian Health Ministers. *National Mental Health Plan 2003-2008*. Canberra (AUST): Commonwealth of Australia; 2003.
16. Mental Health Standing Committee of the Australian Health Ministers' Advisory Council. *Council of Australian Governments National Action Plan for Mental Health 2006-2011: Progress Report 2006-07*. Canberra (AUST): Council of Australian Governments; 2008.
17. Department of the Prime Minister and Cabinet. *A Stronger, Fairer Australia: National Statement on Social Inclusion*. Canberra (AUST): Commonwealth of Australia; 2009.
18. Australian Health Ministers. *Fourth National Mental Health Plan: An Agenda for Collaborative Government Action in Mental Health 2009-2014*. Canberra (AUST): Commonwealth of Australia; 2009.
19. Hayes A, Gray M, Edwards B. *Social Inclusion: Origins Concepts and Key Themes*. Canberra (AUST): Social Inclusion Unit, Department of the Prime Minister and Cabinet; 2008.
20. Siegrist J. Adverse health effect of high effort-low reward conditions at work. *J Occup Health Psychol*. 1996;1:27-43.
21. Karasek RA. Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*. 1979;24:285-308.
22. Summerfield M. *HILDA User Manual – Release 9*. Melbourne (AUST): Melbourne Institute of Applied Economic and Social Research, University of Melbourne; 2010.
23. Leach LS, Butterworth P, Rodgers B, Strazdins L. Deriving an evidence-based measure of job quality from the HILDA Survey. *Australian Social Policy Journal*. 2010;9:67-86.
24. Siegrist J, Starke D, Chandola T, Godin I, Marmot M, Niedhammer I, et al. The measurement of effort–reward imbalance at work: European comparisons. *Soc Sci Med*. 2004;58:1483-99.
25. van Vegchel N, de Jonge J, Bosma H, Schaufeli W. Reviewing the effort-reward imbalance model: drawing up the balance of 45 empirical studies. *Soc Sci Med*. 2005;60:296-305.
26. Melbourne Institute of Applied Economic and Social Research. *Household, Income, and Labour Dynamics in Australia (HILDA) Survey, Annual Report 2009*. Melbourne (AUST): The University of Melbourne; 2009.
27. Leach LS, Butterworth P, Strazdins L, Rodgers B, Broom D, Olesen SC. The limitations of employment as a tool for social inclusion. *BMC Public Health*. 2010;10:621.
28. Gill SC, Butterworth P, Rodgers B, Mackinnon A. Validity of the mental health component scale of the 12-item Short-Form Health Survey (MCS-12) as measure of common mental disorders in the general population. *Psychiatry Res*. 2007;152:63-71.
29. Ware J, Kosinski M, Keller SD. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Med Care*. 1996;34:220-33.
30. Butterworth P, Rodgers B. Concordance in the mental health of spouses: analysis of a large national household panel survey. *Psychol Med*. 2006;36:685-97.
31. Australian Bureau of Statistics. *ANZSCO – Australian and New Zealand Standard Classification of Occupations, First Edition*. Canberra (AUST): ABS; 2006.
32. Butterworth P, Leach LS, Rodgers B, Broom D, Olesen SC, Strazdins L. *Criterion Validity of Measures of Psychosocial Job Quality in the HILDA Survey*. Canberra (AUST): The Centre for Mental Health Research; 2011.
33. Cheng Y, Kawachi I, Coakley EH, Schwartz J, Colditz G. Association between psychosocial work characteristics and health functioning in American women: prospective study. *BMJ*. 2000;320:1432-6.
34. D'Souza RM, Strazdins L, Lim LL, Broom DH, Rodgers B. Work and health in a contemporary society: demands, control and insecurity. *J Epidemiol Community Health*. 2003;57:849-59.
35. Sekine M, Chandola T, Martikainen P, Marmot M, Kagamimori S. Socioeconomic inequalities in physical and mental functioning of British, Finnish, and Japanese civil servants: role of job demand, control, and work hours. *Soc Sci Med*. 2009;69:1417-25.
36. Stansfeld S, Head J, Fuhrer R, Wardle J, Cattell V. Social inequalities in depressive symptoms and physical functioning in the Whitehall II study: exploring a common cause explanation. *J Epidemiol Community Health*. 2003;57:361-7.
37. Singer JD, Willett JB. *Applied Longitudinal Data Analysis: Modelling Change and Event Occurrence*. New York (NY): Oxford University Press; 2003.
38. Feather NT, Barber JG. Depressive reactions and unemployment. *J Abnorm Psychol*. 1983;92:185-95.
39. Saunders P. *Can Social Exclusion Provide a New Framework for Measuring Poverty?* Sydney (AUST): University of New South Wales; 2003.
40. Butterworth P, Gill S, Rodgers B, Anstey KJ, Villamil E, Melzer D. Retirement and the mental health of older Australians: analysis of the National Survey of Mental Health and Wellbeing. *Soc Sci Med*. 2006;62(5):1179-91.